Document 19, Jan Nissl, Boise, ID
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HLW & FD EIS PROJECT - AR/PF
Control # DC-19

HLW EIS Web Comments

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From: HLWFDEIS Web Site
Sent: Monday, February 14, 2000 9:12 AM
To: web@jason.com
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Subject: HLW EIS Web Comment

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Date Entered: {ts '2000-02-14 09:11:47'}
Comment:

19-1 II.A(5) Treatment should proceed strictly out of concern for environmental protection.
Don't use unproven technology.
"Separations" presents three major problems:

19-2 III.D.3(1)
a. Creates more waste streams to manage
b. Produces greater waste volumes compared to non-separations
c. Poses tremendous technical uncertainties. These technologies have never been demonstrated to work on an industrial scale.

19-3 II.A(1) Treat the calcine and liquid wastes independently. These wastes have different properties and therefore require different approaches. This was also recommended in a recent report from the National Academy of Sciences.

19-4 VII.B(1) Coordinate treatment so as to address all forms of contamination such as groundwater, soil, facilities and the High-level waste.

thank you

Document 20, Donald W. Rhodes, Idaho Falls, ID
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HLW & FD EIS PROJECT - AR/PF
Control # DC-20

RECEIVED FEB 14 2000

Idaho Falls, Idaho
February 10, 2000

Mr. Thomas L. Wichmann
U.S. Dept.of Energy
Idaho Falls, Idaho 83401

Dear Mr Wichmann:

I am sending you my comments on the High Level Waste Treatment options that appeared in the Post Register recently. My comments are of a technical nature based on my many years experience at the Chemical Processing Plant, where I was in charge of developing the chemistry for the calcination process for many years as well as other related waste treatment processes. These comments are not presented in any logical sequence, but are given as they occur to me while preparing this letter.

20-1 III.D.3(1) 1. Dissolving the calcine seems to me to border on the ridiculous. Many millions of dollars and thousands of man hours were spent converting the high level waste to the present granular form. I believe that both Hanford and Savannah River would be very happy to have their high level waste in such an innocuos form. In actual practice, dissolving the calcine is not an easy task. Even the calcine from the aluminum nitrate waste would require some sort of fusion process to dissolve the alpha alumiina that is small in total amount, but is distributed throught the calcine. Extraacting the radionuclides from the liquid after dissolution is not a simple process. Many attempts were made to do this before the waste was calcined, with little success. The end result was a number of wastes, large in volume and containing different levels of radionuclides that would require further treatment for disposal.

20-2 III.D.2.c(3) 2. Although a glass prepared from the calcine is probably a desirable product, converting the calcine to a glass is quite difficult. The process requires very high temperatures, and is dependent on the chemical composition of the calcine. The CPP has four different types of calcine: (1) calcine from calcination of aluminum nitrate waste, (2) calcine from the calcination of ammonium nitrate waste, (3) calcine from the calcination of zirconium fluoride waste, and (4) some calcine from the calcination of intermediate or second cycle waste. I don't believe that records can clearly separate these wastes as to location in the bins. Each of these wastes would probably require some modification for any solidification process that was used. In terms of the contained radionuclides in the waste, the Ru-106, Ce-144, and Zr-Nb-95 would probably be largely decayed.
The Sr-90 would still be there, but would probably not cause a migration problem during the glassification process. The Cs-137, on the other hand, would largely be released and have to be collected during the glassification process. In fact, migration of Cs-137 has been occurring during storage in the bins because of the heat generated by the decay of fission products. In addition to these problems, the energy requirements for glasification will be very high, and the materials of construction that will be needed for the equipment to do the glassification will be very espensive.

20-3 III.D.4(1) 3. There is another potential process to immobilize and protect the calcine, that was not included in the options, that I believe could be used. It would be much less costly than any of the other

options presented, and provide a high level of safety during storage. This process consists of imbedding the calcine in a metal matrix which is itself contained within a metal cylinder. The metal matrix that I suggest is aluminum. This was done on a laboratory scale as early as 1969, and was reported in IN-1322 The author is myself. The laboratory study was done with nonradioactive calcine. A stainless tube was filled with granular calcine. Molten aluminum was then drawn up through the calcine using a vacuum, and an inert atmosphere to prevent aluminum oxide from forming.The metal is allowed to extend beyong the calcine at both ends of the tube, thus forming a sealed system. In order for the radionuclides to be leached from the calcine, the tube would have to be penetrated by corrosion. Even then, the leaching would be very slow because of the aluminum matrix that protects the calcine particles. The tubing containing the calcine could be any thickness desired to provide the desired long-term protection. If really, really long term protection were desired, the tube containing the calcine could be placed within a second stainless steel or ceramic cylinder and a second pouring of metal could be made to seal the tube containing the calcine within the secondary container. Long term stability could easily be provided by the proper choice of containers. Some of the advantages of this process over the other proposed processes are as follows:

1. This process can be done at relatively low temperatures (aluminum m.p. 650 decgrees C), compared to a glassification process.
2.. The energy requirements are low compared to a glassification proecess..
3. Migration of Cs-137 would be negligible at the low temperatures required to melt aluminum.
4. The cost of materials would be relatively low, because ordinary stainless steel and/or ceramic tubing could be used.
5. Argon, which is reasonable in cost, could be used to provide the inert atmosphere.
6. Leaching of radionuclides could be zero for as long as desired by choosing the right containment materials.
7. Handling the stainless steel or ceramics tubes could be done with conventional equipment.
8. The tubes containing the calcine could be transported and stored easily.
9, The aluminum metal and steel container would reduce the external radiation significantly.
10 The process is basically not affected by the chemical composition of the calcine.
11. End caps can be welded on the ends of the tube, thus making it a totally sealed system.
12. The ss tubing would totally shield out the beta radiation, and attenuate somewhot the gamma.
13. The metal matrix provides good heat transfer for any decay heat.]

If you have any questions or if I can be of any help, I can be reached at 652 Brentwood Circle, Idaho Falls, Idaho 83402, phone, 522-8673.

Very truly yours,

D W Rhodes

D. W. Rhodes

HLW & FD

EIS PROJECT - AR/PF
Control # DC-21

Idaho High-level Waste and Facilities Disposition
Draft Environmental Impact Statement
U.S. Department of Energy Idaho Operations Office

Written Comment Form
Must be postmarked or dated by March 20, 2000

I don't know enough about the issues discussed at this meeting, but this seems like a complicated ordeal. All I know is
21-1 III.E(3) that [I prefer storing the waste in the safest possible way (i.e. not harmful to the public, workers, or environment), or to move the waste elsewhere.] [I don't think cost should matter. Feeling
21-3 X(9) safe doesn't have a dollar value]

21-4 IX.B(3) [The high schools in the area should have been notified, because the Times News cannot be counted on as a source of information — this meeting was reported to be about nuclear incinerators. Basically, the next generation needs to understand these issues.]

21-5 IX.C(3) [The registration staff was not only helpful, but friendly — a good change of pace in this area! Most public hearings have no staff at all, or are there only to get people to pick up informative papers.]

Written comment forms may be faxed to:
Thomas L. Wichmann
EIS Document Manager
208-526-1184

Written comment forms may be mailed to:
Thomas L. Wichmann
EIS Document Manager
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

Or send comments via the internet at: http://www.jason.com/hlwfdeis